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ontario hydro
research division

To: Mr. A.M. Wilson
Manager
Hydraulic Generation Services
Thermal and Hydraulic Generation Division

ALEXANDER GS - UNITS 2 AND 4
TURBINE PERFORMANCE TEST - ELECTRICAL RESULTS

W.S. Fischer

Turbine Performance Tests were performed at Alexander GS, Units 2 and 4 on October 1st and 2nd, 1986. The electrical test results contained in this report have been corrected for all metering errors except those which may originate in the station instrument current and potential transformers.

As requested by I. Munro of Hydraulic Generation Services, Research Division personnel performed the necessary electrical measurements to determine the generator electrical output power and the turbine output horsepower during Turbine Performance Tests at Alexander GS, Units 2 and 4. The units were operated at unity power factor over a range of wicket gate openings. Power was integrated for two minute intervals during a twenty minute test run coincident with waterflow measurements. Appendices A and B contain the corrected generator and turbine outputs.

Electrical power was measured using a Scientific Columbus digital watt/watthour transducer, S/N 3961, connected in a two-element, three-wire configuration. As noted in the attached calibration, Ontario Hydro Research Division Report No EC86-323-K, the transducer was calibrated after the completion of the tests in the Standards Laboratory, Electronics and Instrumentation Section of the Electrical Research Department, to an accuracy of $\pm 0.1\%$. The calibration factors have been applied to the appropriate electrical measurements.

The maximum error in the generator electrical output measurements does not exceed $\pm 0.1\%$ excluding the current and potential transformer errors. These transformers were not calibrated and no correction factors were available for them.

The generator turbine horsepower is calculated as shown below. Generator losses are obtained from the manufacturer through the Hydraulic Plant Equipment Department.

$$\text{Turbine Power} = \frac{(\text{Generator Output} + \text{Generator Losses})\ \text{kW}}{0.746}\ \text{HP}$$

Approved:

A.F. Baljet
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Manager
Electrical Research Department

Submitted:

W.S. Fischer
Technician
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WSF:llg

Oct 1, 1986

APPENDIX A

ALEXANDER GS - UNIT NO 4

Run #	Time	Generator Output(kW)	Generator Losses(kW)	Turbine Output(HP)
1	9:00	7104	285	9905
2	9:20	8275	308	11505
3	9:40	11990	358	16552
4	10:00	13311	374	18345
5	10:20	14321	388	19717
6	10:40	14602	400	20110
7	11:00	15122	414	20826
8	11:20	15412	426	21231
9	11:40	15663	430	21572
10	12:40	14992	410	20646
11	13:00	14291	384	19672
12	13:20	12900	363	17779
13	13:40	15092	410	20780
14	14.00	15512	428	21367
15	14:20	15713	430	21639
16	14:40	13631	376	18776
17	15:00	14622	400	20137
Motoring#1	12:04	-5383	226	6913
Motoring#2	15:04	-5763	226	7422

Oct 2, 1986

APPENDIX B

ALEXANDER GS - UNIT NO 2

Run #	Time	Generator Output(kW)	Generator Losses (kW)	Turbine Output (HP)
1	9:00	7629	265	10227
2	9:20	9494	298	12727
3	9:40	11744	336	15743
4	10:00	12925	365	17326
5	10:20	13300	370	17828
6	10:40	13440	380	18016
7	11:00	13631	390	18272
8	11:20	13801	400	18500
9	11:40	13821	400	18527
10	12:00	9827	301	13173
11	12:40	11088	320	14863
12	13:00	11856	338	15893
13	13:20	13066	366	17515
14	13:40	13430	380	18003
15	14:00	13711	390	18379
16	14:20	13905	394	18639
17	14:40	13935	394	18680
18	15:00	13763	392	18449
motoring#1	12:02	-3454	198	4630
motoring#2	15:05	-3644	198	4885

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